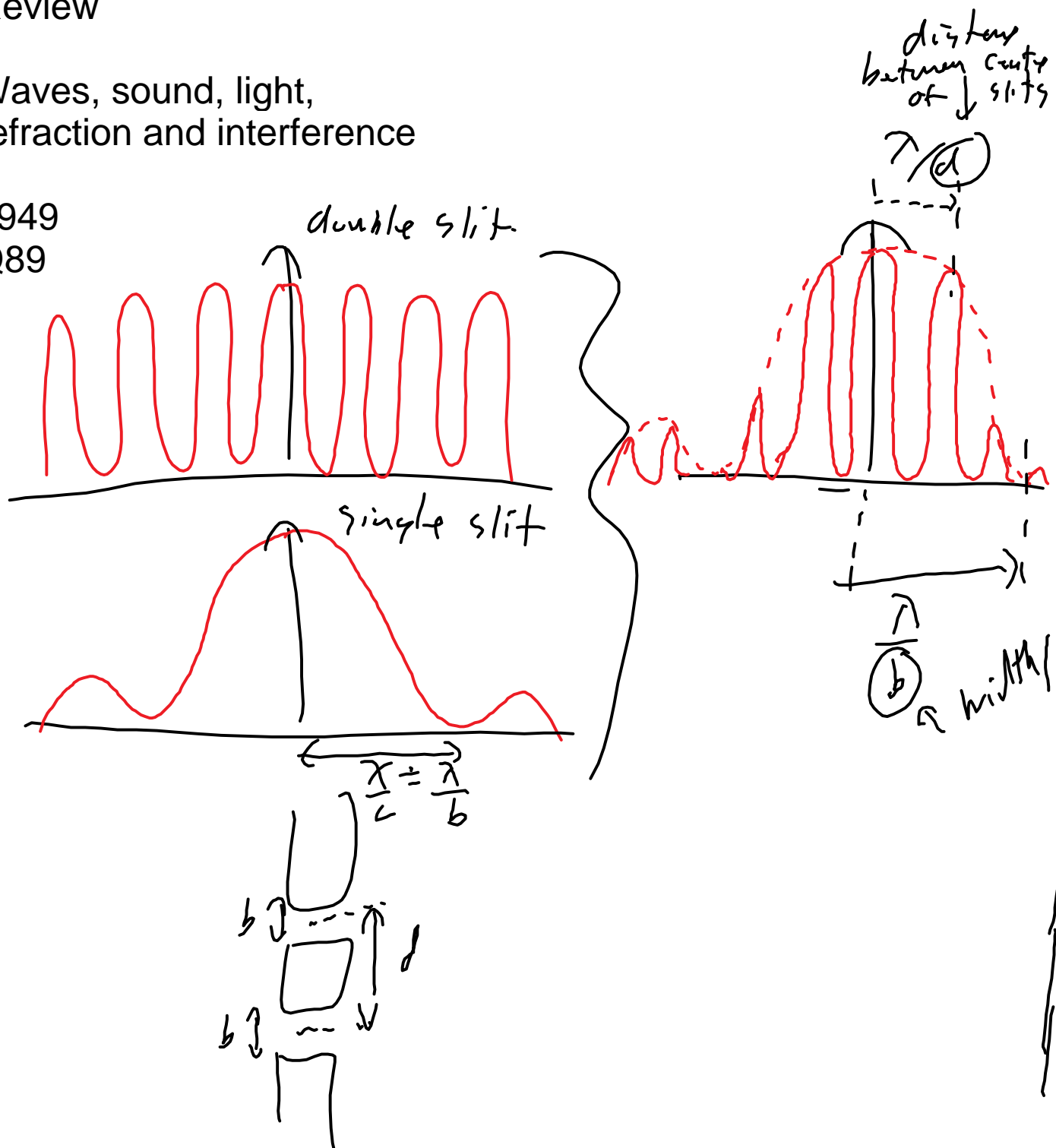


Review

Waves, sound, light,
refraction and interference

p949
Q89



width of bright band

$$= 2\lambda$$

$$\frac{\lambda}{2} = \frac{\lambda}{b}$$

$$x = \frac{\lambda L}{b} = \frac{500 \text{ nm} (2 \text{ m})}{0.10 \text{ mm}}$$

$$x = 1.0 \times 10^{-3} \text{ m}$$

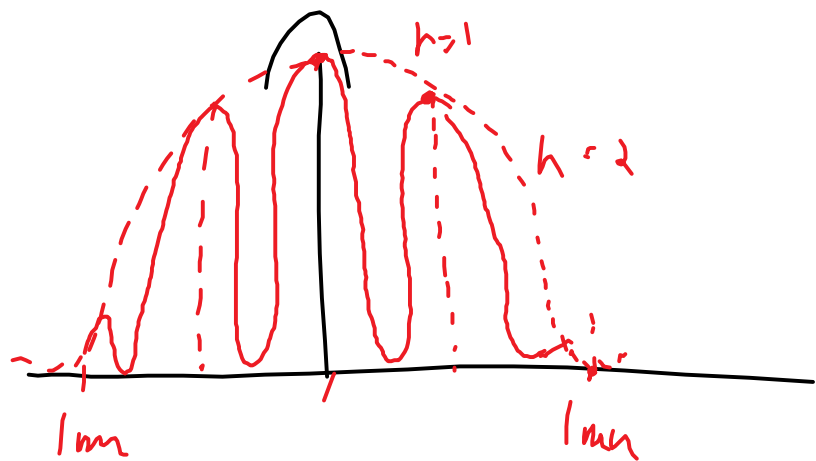
$$2x = 2.0 \times 10^{-3} \text{ m}$$

$$\frac{x_2}{L} = \frac{n\lambda}{d}$$

$$x_2 = \frac{500 \text{ nm} (2 \text{ m})}{0.2 \text{ mm}}$$

$L = d \text{ to } 2 \text{ mm}$

$$x_2 = 5.0 \times 10^{-4} \text{ m}$$

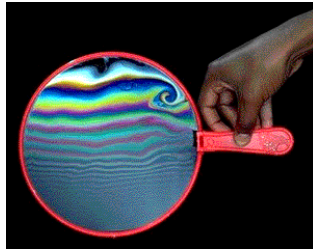


3 peaks + 2 half peaks
= 4 peaks

central
band
 $\frac{2(\lambda/b)}{\lambda/d}$
double
slit

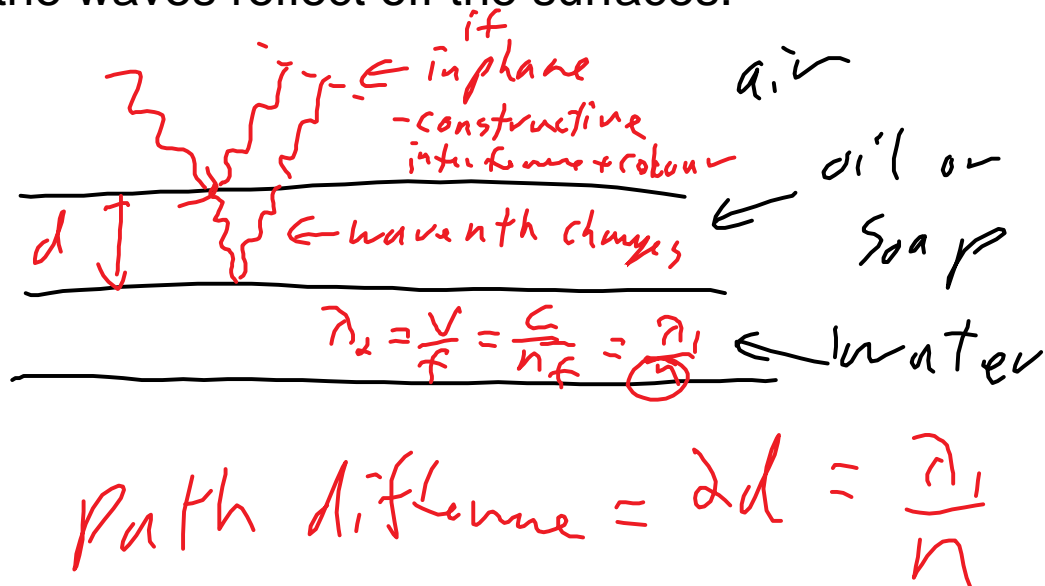
$$= \frac{2d}{b} = \frac{2(0.2 \text{ mm})}{0.1 \text{ mm}} = 4$$

Thin Film interference



why are there colours as the light reflects off soap and water or oil and water?

Different colours have different wavelengths
As the waves reflect off the surfaces:



destructive $\rightarrow 2dn = m\lambda$

or

constructive $\rightarrow 2dn = (m + \frac{1}{2})\lambda$

↑

whole number

IB data Book

Study for the test

p947 Q51, 57, 61

Q96 $\theta = 1.22 \frac{\lambda}{b}$

$$\theta = 1.22 \frac{550 \text{ nm}}{0.75 \text{ mm}}$$

$$\theta =$$

Q100 $\theta = 1.22 \frac{\lambda}{b} = \frac{1.22 \cdot 550}{2.4}$

$$= \frac{\lambda}{L} = \frac{5 \text{ m}}{1.28 \times 10^7 \text{ m}}$$